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AMBLYOPIA ALCOHOLICA.

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Amblyopia alcoholica as a rule occurs in the steady drinkers, those who take their drams regularly and in liberal quantities, and who keep up their effects for a long time. Men who get on sprees and have intervals of abstinence from all intoxicating beverages for a season do not suffer from it, for the system has an opportunity to entirely recover from the effects of the alcohol. The susceptibility to the toxic influence of alcohol differs with different individuals, and is of course influenced by the quality and kind of liquor indulged in, as well as the quantity.

I saw one young man of *nineteen*, with white atrophy of both of the nerves from excessive indulgence in beer alone. He was grossly fat, and presented a beastly and disgusting appearance. As a rule, however, toxic amblyopia occurs at a later period of life and in men who have for a long time been toppers, and where the physical condition is beginning to succumb to the slow poison. Considering the number who indulge more or less freely in stimulants, and who persist in it for years, it is surprising that the sight is not involved more frequently. Indulgence in stimulants is generally associated with excessive use of tobacco, and

thus two toxic influences are brought to bear on the system at once.

If cases of amblyopia from either alcohol or tobacco, or both combined, are seen in the early stages, before atrophy of the nerves has set in, there is a chance for recovery, if the patient will submit to the treatment—*total abstinence*—but, unfortunately, this seems too much to ask of them. With the dread alternative of blindness before them, they will promise compliance with instructions, but often relapse into their old ways and suffer the consequences.

There is a difference of opinion among drinkers as to the toxic qualities of the various liquors. A patient whom I was treating stopped the use of brandy, whisky and wine, but still kept up for a while (until I discovered it) the daily use of beer, on the ground that beer could not hurt any one.

If a cure is effected, it must be by the co-operation of the patient, and a total abstinence from all beverages which contain any alcohol. The use of tobacco must also be limited to the smallest possible allowance. If tobacco is entirely forbidden, in the cases where both alcohol and tobacco have been freely used, the patient usually suffers from gastric disturbance unless a chew of tobacco or a cigar is allowed after each meal. This can, later on, when the case is progressing favorably, be cut off also.

CASE I.—W. J., 27, German, grocer and saloon keeper. The following history was obtained: He has noticed for several months that his eyesight has been failing, and for some weeks he has not been able to read ordinary print. He has difficulty in recognizing acquaintances, and in making change for his customers. He is a healthy-looking man, and has always enjoyed good health. He has never had any previous trouble with his eyes, and there are no spinal or cerebral symptoms to indicate a central cause for the amblyopia. The tactile sense is perfect, and he has no trouble in locomotion. He is in the habit of drinking beer ("pony" glasses) with his customers, but *never* gets drunk. He smokes moderately. Vision in right eye is reduced to counting fingers at 4', and with left eye is $\frac{29}{6}$ and reads Sn No 15. The fundus oculorum appear healthy, with the exception of the

optic disks, which are congested and hazy. There is no diminution in the calibre of the vessels on the disks.

Nov. 15, 1880. Hypodermic injection of strychnine; and ordered pills of nux vomica and gum camphor.

Nov. 18. $V = \frac{20}{c}$ l. and r. e. unchanged.

Dec. 13. Vision same.

Jan. 13, 1881. $V = \frac{20}{c}$ l. and fingers at 8' r. e.

March 7. $V = \frac{20}{L}$ r. and l. e.

May. $V = \frac{20}{XL}$ r. and l. and reads Sn 1.

June 27. $V = \frac{20}{XXX}$ r. and l.

Sept. 15. $V = \frac{20}{XXX} +$

He was not seen again until December, when vision was perfect in each eye. The treatment was left off during this time, and I have reason to believe that he carried out faithfully the total abstinence rules laid down. The unusual features of this case are the slowness of recovery. It was four months before his vision came up to $\frac{20}{L}$, and six months before he could read Sn No. 1. The improvement was so slow I began to feel discouraged, but the final result was very gratifying.

CASE II.—J. D. K., æt. 43, has noticed a gradual failure of vision for several weeks past, and for four weeks has not been able to read ordinary print. For years he has used stimulants, but for a few months he has been drinking excessively. He drinks whisky principally, and also chews and smokes to excess. He eats very little solid food.

Vision in right eye is $\frac{20}{c}$, and with left eye can count fingers at 2' only. The optic disks present an hyperæmic appearance.

I gave him an hypodermic injection of gr. $\frac{1}{4}$ strychn. sulph., and the next day vision in right eye was $\frac{20}{LXX}$, but left one unimproved. He did not remain longer under treatment, but continued the strychnine treatment after his return home, and in two weeks was able to read ordinary print again.

He followed instructions for awhile, but in a few months lapsed into his bad habits again, and finally died from their effects.

CASE III. J. M. R., 57, in good health, and very well preserved. His eyes have been failing for two months past, and for one month he has not been able to read ordinary newspaper print. There

are a few speculæ of opacity in the margin of the left lens, but in other respects the media are clear in both eyes. The disks appear somewhat paler than normal, but are not atrophied. For the past five years he has averaged eight segars a day, and five or six drinks of bourbon whisky.

He reads Sn 4 slowly with good light. $V = \frac{20}{LXX}$ with either eye. Gave hypodermic gr. $\frac{1}{4}$ strych. sulph.

The next day $V = \frac{20}{L}$, and can read Sn $3\frac{1}{2}$.

2d Injection.—On the following day $V = \frac{20}{XXX}$, and can read Sn $2\frac{1}{2}$.

Gave 3d injection, and in afternoon of same day $V = \frac{20}{XXX} +$, and can read Sn No. 2.

Two months later he reports himself as able to read ordinary print with ease. He carried out the strychnine treatment at home.

In the last two cases the response to the influence of the strychnine injections was prompt and satisfactory, and this has been my experience rather than that of Case No. 1, where the eyes improved very slowly. What influence there was to interfere with the effects of the nervine treatment would be hard to state.

Pure and uncomplicated cases of tobacco amblyopia are in this country at least rather rare. I reported on Feb. 11, 1882, in the *Cincinnati Lancet and Clinic*, which I now add :

TOBACCO AMBLYOPIA.

It is seldom that we ever see a case of pure and uncomplicated tobacco amblyopia. The use of tobacco and spirits are so generally associated that their poisonous effects are diffused through the system simultaneously. We frequently see cases of amblyopia from chronic alcoholism, but all of them were consumers of tobacco to a greater or less extent. The resulting effect is attributed to the toxic influence of alcohol, and the role that tobacco plays is almost lost sight of. This is natural enough, for the toxic influences of the former are so much more powerful than the latter that they get the credit of doing the damage. Men do not abuse themselves with tobacco as they do with spirits, for it does not produce the same degree of exhilaration; still its

continued and excessive use will help to undermine the system and deepen and confirm the effects of alcohol.

Mr. Jonathan Hutchinson reported in the Royal Ophthalmic Hospital Reports (1872) a number of cases of tobacco amarausis. They were cases that had been under his observation for a long enough time to enable him to form a positive and decided opinion as to the final results. He attributes the amblyopia to excessive smoking, and shows from his cases that the failure in vision was coincident with an increased indulgence in tobacco. Some of the smokers were also drinkers; but the toxic effects of tobacco were considered as more potent. This was evidenced by the fact that 75 per cent. either recovered entirely or were greatly improved after quitting the use of tobacco. In his opinion, total abstainers from alcohol were more liable to trouble than those who used spirits moderately, the alcohol seeming to counteract the poison of tobacco. He also observed that after the recovery of vision, his patients were again able to resume the enjoyment of their pipes in moderation without detriment to their eyes.

I am disposed to think that tobacco amblyopia is very rare in this country. Alcohol has, undoubtedly, been the leading factor in all the cases of toxic amblyopia I have seen. The two factors are generally associated, and there is usually excess in both.

The following case I report as the only one of the kind which has ever come under my observation. It proves one point, that tobacco can seriously affect vision, and there is abundant evidence from other observers that atrophy of the optic nerve does follow its excess, as well as that of alcohol.

In this case the patient was not a smoker, but a chewer of the weed. In Hutchinson's cases the use of tobacco by smoking only is mentioned, and the same is true of cases mentioned by German writers. This arises from the fact that chewing is not nearly so common abroad as it is in this country.

I have never seen any statistics which mention excessive chewing of tobacco as a cause of amblyopia, which makes this case one of interest. There seems to be no good reason why chewing should not be as injurious as smoking. The contact of tobacco

with the mucous membrane of the mouth is as promptly, if not more promptly, felt in the brain, as the effects of smoke from a pipe or segar. Then, too, men can chew where they would not be allowed to smoke—as for instance at their work-benches and in places of business where there would be danger from fire, or objection to the odor of smoke.

Mr. E., æt. 50, a tall, slender man, but healthy and well preserved for one of his age. He had led a temperate life in all things but indulgence in tobacco. He was not, and never had been addicted to the use of intoxicating liquors, and smoked very seldom.

He had recently noticed a mist before his eyes, and had difficulty in recognizing his friends, and vision had failed so much that he could not read ordinary print. His sight had failed decidedly within the past few weeks, and he had at last become alarmed. He was in the habit of chewing ordinary plug tobacco, and used from one to two ounces daily.

Examination showed his vision to be $\frac{20}{60}$ r. e. and $\frac{20}{100}$ l. e. The ophthalmoscope showed a healthy fundus, with the exception of the optic disks, which were congested, and resembled those of a person suffering from chronic alcoholism.

I determined to try the influence of hypodermic injection of strychnia, and gave him $\frac{1}{1000}$ gr. in the arm. In the afternoon, about four hours after the injection, his vision had increased to $\frac{20}{12}$ r. and $\frac{20}{100}$ l. e.

The next day his vision had not diminished, and a second injection was given, which brought his vision up to $\frac{20}{100}$, in the right eye, the left remaining, as it was yesterday.

He had to return home, and was ordered small doses of strychnine three times daily, to be continued until his return.

In twelve days he again presented himself, and it was found that vision was $\frac{20}{12}$ r. and $\frac{20}{100}$ l. eye.

The vision in the right or weaker eye had sunken a little, but the left had not lost anything. He could now read ordinary print with ease, and recognize objects and persons in the distance very well. The haze before his eyes had vanished; and objects were clear and distinct. Another hypodermic injection of strychnine was given, but it did not improve the vision appreci-

ably. He returned home and continued the internal use of the nervine for several weeks.

He quit the use of tobacco from the first day of treatment, and has not since indulged in it.

It is now three years since the above treatment, and he still maintains good vision. He has gained considerably in flesh, and enjoys good health.

PEROXIDE OF HYDROGEN.

BY F. ALLPORT, M. D., MINNEAPOLIS, MINN.

Peroxide of hydrogen, notwithstanding the dormant condition in which it has for years remained, is a remedy possessing great therapeutic value. It was discovered by Thenard, a French chemist, in 1818, and first introduced as a medicine by Richardson, of London, in 1858. It is produced by the action of hydrochloric acid on the peroxide of barium. Its formula is H_2O_2 , and its specific gravity 1.453. It is a colorless liquid, appearing exactly like water, but thicker in its consistency. Its odor resembles dilute chlorine, in taste it is astringent and rather metallic, and it remains liquid at zero. A temperature of $70^{\circ}F.$ will cause oxygen to escape in bubbles, but when heated to the boiling point of water, oxygen will be rapidly evolved, almost with explosive force. It unites easily with water in any proportion, and, when thus united, the evolution of oxygen is less rapidly accomplished.

The peroxide of hydrogen is easily decomposed by many finely-divided metals and metallic oxides. Gold, silver and platinum cause it to give up an atom of oxygen and to be resolved into water, and fibrine and cellular tissue have the same effect. Ammonia, hydrocyanic acid, tobacco, aconite, and most other narcotic substances, not only render the peroxide of hydrogen more stable, but actually prevent it from oxidizing other substances. It causes sugar and starch to evolve carbonic acid, but albumen, gelatine, urea and cutaneous tissue have no effect upon it. Peroxide of hydrogen bleaches litmus and many vegetable colors, and when placed upon the tongue bleaches it, and for a time destroys sensation.

By its means hair may be bleached and turned to a golden

color, and it is much used by the demi-monde for this purpose.

Internally the peroxide of hydrogen has not been practically demonstrated to possess especially meritorious features, but locally it forms an exceedingly valuable addition to the armamentarium of antiseptic surgery. As has been mentioned, its formula is $H_2 O_2$, but the preparation is of so unstable a character that it readily decomposes and liberates one atom of oxygen upon contact with various substances, pus among the number.

The oxygen thus liberated is in a nascent condition, is exceedingly active, and will force the escape of pus from any cavity in which it may be contained. In this proneness to decomposition and liberation of nascent oxygen, lies its value as a cleansing and antiseptic agent.

While peroxide of hydrogen is of great value in the treatment of wounds, ulcers, &c., it is especially useful in treating cavities difficult of access. And it is on this account dentists have found it of such singular utility as a local application in alveolar abscesses. When instilled into a septic cavity contact with pus immediately causes the liberation of oxygen, and, being nascent and active, every portion of the cavity, however remote, is cleansed of the products of decomposition.

This process being several times repeated, the cavity will be found entirely bereft of all purulent deposits, and in a thoroughly antiseptic condition. The foulest and most putrid cavities can in this manner be rendered utterly devoid of unpleasant odor.

I first commenced using this agent in a very foul and unhealthy mastoid cavity, after the cells had been exposed by operation. Gratified by the results obtained I have since continued its use, whenever its peculiar and remarkable qualities have rendered it admissible.

Peroxide of hydrogen is valuable in cleansing and disinfecting the middle-ear in suppurative inflammation, preceding and in conjunction with the ordinary insufflation of boracic acid, iodoform, &c. In using it for such affections a few drops are instilled into the meatus, the patient lying on the opposite side. In a moment bubbles will be expelled, the meatus is then quite

thoroughly dried and a few more drops are instilled. This operation I repeat until effervescence ceases to occur, when the ear should be wiped thoroughly dry and insufflation made. If the aperture is quite small I inject a few drops through the opening by means of a middle-ear syringe, which will cause the expulsion of any pus contained in the middle-ear. I have found progress much more rapid by this treatment than by the use of insufflation alone.

This agent is efficient, also, in all purulent affections of the eyes. It can be used undiluted, but it is better diluted one-half or one-third, as circumstances may dictate. This suggestion is also applicable when used in the ear. I have found purulent affections of the tear-passages yielding, by this means, much more readily than by any other method. I generally combine the usual probing, etc. with it, and simply use it as an injection preceding the passage of the probe. I usually employ the diluted form, and inject it into the tear passages, by means of the lachrymal syringe. I repeat these applications two or three times at each treatment, squeezing out, by pressure over the canaliculus, as much of the preceding injection as possible.

I have found peroxide of hydrogen successful in severe cases of gonorrhœal ophthalmia and ophthalmia neonatorum. Cleanliness being one of the essential features in the treatment of these cases, I have heretofore, every hour, as thoroughly as possible, cleansed the eye by means of a solution of boracic acid. This accomplished the purpose to a certain extent, but the peroxide of hydrogen is far superior in its cleansing and disinfecting properties, and much easier to apply. It is quite difficult and often impracticable to do as the books advise, viz., insert the end of a smooth-pointed syringe into one angle of the eye and then inject. The lids are often so swollen as to render this almost impossible, and in unmanageable children it often becomes quite dangerous, as they are likely to do damage to the eye-ball.

In using this agent for such affections the eye should be as widely opened as possible, a few drops instilled, and quickly closed. The eye should be kept as tightly closed as possible, in order that the escaping oxygen may find its way to the remote parts of the lining mucous tract. Bubbles will soon escape from

between the lids, and the parts should then be wiped as dry as possible, and the operation repeated several times, that thorough cleanliness may be insured. This need not interfere with the other methods of treating these diseases, such as nitrate of silver, iodoform, &c. I simply advocate it as a substitute for the washing and cleansing process. It may be done every hour, or four or five times a day, as seems best. In purulent and ulcerative keratitis I have obtained better results with the peroxide of hydrogen than would have been probable by other methods.

In all purulent diseases of the eye or lids, where we wish to maintain a clean and antiseptic condition of the parts, I would cordially recommend its adoption.

EYE CLINIC.

BY W. CHEATHAM, M. D.,

Lecturer on Diseases of Eye, Ear and Throat, University of Louisville.

Mr. H., aged 42, a stout, healthy farmer, came to me complaining of loss of vision in both eyes. It appeared to him as if he was looking through a heavy veil or fog. It had been coming on for four months.

Vision = $\frac{1}{6}$ each eye; no error of refraction; color perception good. Ophthalmoscope shows no deviation from normal, except a peculiar "brick-dust" color of nerve entrance. Drinks 18 or 20 glasses of beer per day; smokes pipe a great deal. The case I diagnosed as one of amblyopia, from over-use of beer and tobacco. Cut the use of both off short. My belief is that this is the only way to do. Gradual disuse is a failure. I commenced the hypodermic use of strychnia nit., gr. $\frac{1}{60}$, and increased slowly to gr. $\frac{1}{6}$, when the physiological effects of the strychnia were reached. I then put him on ext. nuc. vomic. and zinc phosphide in pills, which was continued, at intervals, for three months, when he was discharged with vision $\frac{20}{20}$. Mr. H. gave no history of any constitutional trouble whatever. Had never had syphilis. Is the father of five healthy children.

Dr. F., aged 48, a physician of twenty-five years' practice. General health good. Has noticed his vision failing for several weeks—a peculiar haze or cloud before his eyes; neither headache nor vertigo. Vision = $\frac{5}{6}$. Ophthalmoscope shows a dead red nerve entrance, simulating closely the appearance of the surface of a common brick. This appearance of the nerve entrance is, in my opinion, common in alcoholic and tobacco amblyopia. Dr. F. does not use alcohol in any form, but says he has smoked as many cigars as any man living. The latter I cut

off immediately. In 48 hours his vision was $\frac{2}{L}$. In three weeks under the use of the ext. of nuc. vomic. and zinc phosphide, and total disuse of tobacco, his vision was $\frac{2}{X}$.

In the last few years I have seen five other such cases. I know in the minds of many the efficacy of strychnia is doubted. My experience with strychnia alone is not very encouraging. Still I give my patients the benefit of the doubt. I have used, by gradually increased doses, as much as gr. $\frac{1}{4}$ before getting the physiological effect; often I get it at gr. $\frac{1}{16}$. I have seen the vision jump from $\frac{2}{C}$ to $\frac{2}{X}$ from one injection, but next day be back to $\frac{2}{C}$ again. Of course it is difficult to differentiate the effects of the strychnia and the removal of the original cause. I feel sure I have gotten good and lasting effect from the combination of ext. of nux vomica and zinc phosphide. In several of my cases of alcoholic and nicotine poisoning I have failed to get vision over $\frac{2}{L}$. I sometimes get favorable results from pot. iodide, and in cases in which I am positive there is neither syphilis nor scrofulosis. In one case I allowed the patient to continue the use of the alcohol and tobacco, as of old, and succeeded in a slow but sure improvement of vision up to $\frac{2}{L}$ under the use of camphor, ext. of nux vomica and zinc phosphide. Could not get vision above $\frac{2}{L}$ though until the alcohol and tobacco were stopped, when his vision increased to $\frac{2}{X}$. This case, to my mind, is conclusive that we do get good effect from medication. I should have said I tried total abstinence with increase of vision to $\frac{2}{L}$ as a result, and a return of loss of vision with a return to use of alcohol and tobacco.

Mary M., aged 12, full of struma; rather feeble-minded. She is one of the worst cases of trachoma I ever saw. Lid tremendously thickened; a diffuse, thin opacity of both corneæ; slight pannus. She has been taking, during the time I have treated her, pot. iod., hyd. bichlor., syr. iod. iron, and cod liver oil. Locally I had tried argent. nit. in strong and weak solutions, cupr. sulph., lapis divinus, tannic acid in powder, powdered boric acid, scarification, and shaving off the trachomatous bodies with scissors and knife, with no lasting good result. I also tried the jequirity infusions, and afterwards the pulverized jequirity was put in daily for a week (the powder was effective with others)

without producing a particle of inflammation. I of course was feeling greatly discouraged. The idea of digestion of the trachoma occurred to me. I had Mr. J. A. Flexner, of this city, to prepare for me the following :

R	Ext. pancreatis (Fairchild's.)	-	-	-	℥ij
	Soda bicarb.	-	-	-	gr. x
	Pv. sacch. alb.	-	-	-	℥iv

I everted the lids daily, and packed the powder in them thoroughly, keeping the eyes closed for 15 or 20 minutes each time. In six weeks the trachoma is reduced fully one-third. I hope to report this case as recovered in the not distant future.

CASE OF CYST OF THE CILIARY BODY.

BY DR. JOSEPH AUB, CINCINNATI.

Cystoid developments in the iris, the results of injury and usually produced by engagement of the iris in the cicatrix following such injury, are not rare occurrences. The location of such cysts is usually at the angle of the iris and they extend thence into the anterior chamber. The occurrence of such cysts in other portions of the uveal tract has been mentioned, as far as I can find in the literature at my disposal, but a single time and that by Alt, of St. Louis. In his case the cyst was discovered in the æquatorial region of the eye and was idiopathic. I have therefore thought that it would be of interest to the profession to report a case which came under my observation in March, 1885, and which I have carefully watched since. At first there was some doubt in my mind as to the correctness of the diagnosis first made, but repeated examinations of the patient gave me ample opportunity to verify the diagnosis as well as to observe the steady growth of the cyst.

John Sheahan, æt. 27, was cut in the forehead and right eye on November 5, 1884. P. claims the eye-sight was immediately affected. When brought to the physician for treatment there was considerable swelling of the parts, the forehead had two ugly gashes passing down through the upper eyelid and one extending into the lower. The upper lid margin was not divided. Stitches were introduced to unite the lips of the wound and ice applications were ordered. No trouble of the eye was discovered at the time, perhaps not looked for. Union of the wounds occurred by first intention and the stitches were removed in the course of a week. The lid still remained swollen and heavy until the end of December. P. observed the

trouble with the sight immediately after the removal of the bandage and claims the sight has diminished gradually since. He has no pain, no redness in the eye. At the inner side of the cornea about 3''' from corneo-scleral margin is a scar about 4''' in length and perfectly vertical in direction. The conjunctiva and sclerotic are firmly united at this point, the scar is attenuated and the dark choroid shows through. There is a decided depression of the cicatrix throughout its entire extent, anterior to it the eye is becoming staphylomatous. Cornea is perfectly clear, anterior chamber free, pupil oval and drawn towards the cicatrix. Iris brilliant, its outer pupillary margin attached to lens capsule. Lens clear, except on the posterior surface are seen small pigment deposits, possibly due to hemorrhagic clots. Just behind the lens and springing from the ciliary region is an oval body, with its larger end extending half way across the eye and into the vitreous. By oblique illumination the edge of the cyst looks white and can be clearly defined. Its surface is dotted here and there with pigment deposits. By direct examination with the ophthalmoscope the cyst walls are transparent and the details of the fundus can bedimly recognized through them. $S = \frac{9}{c.c.}$. No improvement with glasses. Atrop. sulph. was ordered and P. told to return in two days. On his return the pupil was found irregularly dilated. Lens was bulging upwards and inwards and anterior chamber correspondingly shallow at that point. The entire posterior surface of the iris, upwards and outwards, was found attached to the lens capsule. The cyst can now be distinctly seen from its apex to its point of origin in the centre of the cicatrix about $\frac{1}{2}$ ''' behind the suspensory ligament. It pushes the lens forwards and is extending further into the vitreous. The vitreous has become slightly cloudy, S. being reduced to $\frac{6}{c.c.}$ T 1. An ointment of unguentum hydrarg. 5 iij. and ungt. bellad. 5j. was ordered over the forehead at bedtime and the sol. atrop. was stopped. Two weeks later the eye was in the same condition, except that the tension had become normal. No growth of the cyst.

The patient was kept under observation until May 15, when the cyst had extended beyond the median line. Its outlines could

be distinctly defined in the now perfectly clear vitreous. Ant. chamber was still shallow upwards and inwards and no other change noticeable. S. had improved to counting fingers in nine feet. P. left the city for the North and has not been seen since.

CATARRHAL OPHTHALMIA—"PINK EYE."

BY L. WEBSTER FOX, M. D., OPHTHALMIC SURGEON TO THE
GERMANTOWN HOSPITAL.

The large number of cases suffering with this disease, which have recently come under my care at the eye clinics of the Germantown and Jefferson Medical College Hospital and in private practice, led me to investigate the cause and spread of the present epidemic raging about Philadelphia. This disease was quite rife among domestic animals several years ago, particularly among horses, and it was at this time that the name "pink eye" was given the disease by the laity on account of the peculiar pink color of the eye-ball.

Catarrhal ophthalmia has been known suddenly to attack a great number of persons who happened to be exposed to the same general exciting causes and we have accounts of epidemics where whole battalions of troops were affected and where the disease spread itself more extensively, attacking many of the inhabitants of a town or district.

Assalim, for example, relates that in 1792 several battalions of the Duke of Modena's troops were affected at Reggio. These troops were taken to a distant part of the country and passed the first night after their arrival under the spacious porticos of a convent looking to the North, in the lowest part of the town and near the trenches of a citadel. Many of the soldiers contracted violent catarrhal ophthalmia, which was attributed to the dust of the straw on which they had slept, and not to the moist and cold air of the place, which, as Mackenzie says, was the true cause, and which was so much the more likely to prove hurtful.¹

In 1778 the whole neighborhood of Newbury in England was afflicted and in 1803, Paris was the seat of widespread epidemic, while in 1861 Vienna did not escape.

The secretion from an eye infected with this disease is the medium through which the disease is propagated. These secretions may be passed from animal to man, also from man to

1. Mackenzie on Diseases of the Eye. pg. 440.

man, and in this manner is the virus disseminated through communities. I have also observed that the discharge in catarrhal ophthalmia, when conveyed to the mucous surface of the conjunctiva either by fingers or a towel, is apt to excite a more violent discharge than the original ophthalmia. No class of people are exempt from it; proving itself, however, the more virulent and intractable among the emaciated and neglected. Eyes that are constantly congested or suffering from any form of conjunctivitis, produced by any cause, are prone to become the seat of the disease. It reproduces itself by direct contact only.

This disease is not limited to the conjunctivæ, but the lining membrane of the nose may become the seat of the affection, a complication which I have on several occasions observed. I think it probable, that the ophthalmia which attacked the equine race two years ago was a muco-purulent conjunctivitis excited either by atmospheric cause or the stigma of certain weeds which grew in the grass fields, and cured with the hay, but that it afterward degenerated into a contagious, perhaps infectious disease; that is to say, that it was propagated by actual contact of the discharge or perhaps from the miasmata floating through the air.

For the last three years sporadic cases have from time to time presented themselves at our clinique. I attribute the present epidemic due, in a manner, to the extreme cold weather of last winter and an atmosphere laden with particles of dust which produced a mild form of conjunctivitis in many individuals who coming in contact with sporadic cases aided in propagating the infection until the disease became epidemic, and again I have found upon inquiry that many horses are at present afflicted. A coachman was recently under my care who traced his attack to a horse that he was attending, suffering with "pink eye". Several members of this man's family contracted the disease. Another family traced the source of their trouble to a favorite dog suffering with "bleared eyes," not noticed by the parents until their attention was called to the fact by myself. Another patient declared his eye trouble developed in about ten hours after a piece of mucus was blown into his eye by the snorting

of a horse that he was leading by the bit, this animal having a slight discharge from his eyes and nostrils at the time.

The disease is ushered in by a sensation of roughness of the lid as if a foreign body had found its way into the palpebral sac—profuse lachrymation which in a few hours changes into a muco-purulent discharge. At this time the conjunctiva becomes swollen and the eye red, and at times painful. The external gritty diurnal pain arises from pressure on the nerves of the conjunctiva and eyelids, whereas the internal, pulsatory nocturnal pain depends on pressure on the ciliary nerves which is reflected to the branches of the fifth nerve radiating from the orbit, especially the supra-orbital branch. Pain is not an early symptom, but usually manifests itself from twelve to twenty hours after the discharge and œdema of the lids. At this stage the Sneiderian membrane becomes inflamed and the patient complains of a “cold in the head,” while in severe cases a feeling of general malaise comes on and temperature rises.

The prognosis is favorable when treatment is instituted early in the disease; when neglected the sequelæ of granular lids may be anticipated. I have at present a patient under treatment suffering from granular lids who dates her trouble to an attack of “pink eye” five months ago. Inasmuch as the ophthalmic surgeon rarely sees these patients in private practice until serious complications arise, it is well for the general practitioner to be informed upon the more recent methods of treatment, as it is to him that an appeal is made after such domestic remedies as an infusion of tea leaves, sour milk, etc., have proved their uselessness. The treatment of the disease is simple—any mild astringent will alleviate the trouble. A favorite remedy and a successful one is a 50 per cent solution of boroglyceride applied every three hours. The ointment of the boroglyceride may be applied to the edges of the lids at night, or lotio chlorini, applied ad. lib. as well as lotio boracis—arg. nit. grs. iij. to 3j. may be relied upon as a sovereign remedy to abort the discharge. A simple domestic remedy, one convenient upon all occasions, is a tablespoonful of pulverized alum to half a pint of water—the eyes to be bathed freely every three hours.

ABORTION FOR THE ALBUMINURIC RETINITIS OF PREGNANCY.

BY LUCIEN HOWE, M. D., BUFFALO, N. Y.

It is no new thing to propose abortion for the albuminuric retinitis of pregnancy. The attention of the profession has been called to the subject before, especially a few years ago by an article by Dr. Loring of New York. It is evident, however, that its importance is not sufficiently appreciated by many practitioners, or else, being timid, they fear to violate the opinion of some authority in obstetrics—doubting just when interference may be necessary.

The object of the present paper is, therefore :

1. To cite a few cases illustrating the fact that the danger to vision in this disease often is in proportion to danger to life.
2. To show that under such circumstances the operation would be warrantable even from the obstetric standpoint alone.
3. To formulate, if possible, some of the indications as to the time when interference is necessary.

Without further introduction I can begin at once to call attention briefly to a few illustrative cases. The different results of recovery, blindness or death will be commented upon later. At present I wish simply to show that such a liability exists. The files of any medical journal will furnish evidence unfortunately of the kind referred to. I therefore turn to a popular publication—*The London Lancet*—and select a few examples.

In 1875 Dr. Jabes Hogg¹ reported there a case of uraemic poisoning, epileptiform convulsions followed by coma, but ultimate recovery with total loss of sight. In the same journal, 1878, Drs. McNamara and Potter give a case of retinitis albuminurica in which the vision improved somewhat after confinement.

In the *Lancet* of April 24, 1879, Dr. W. Alfred Henshaw² cites the case of a woman who became pregnant in '78, and blind from albuminuric retinitis in November, but vision im-

¹ 1875: pp. 823-824.

² 1878: Vol. II., p. 824.

proved soon after, when a miscarriage came on. Mr. Henry Power,¹ M. R. C. S., cites a case of albuminuric retinitis in a recent number of the *Lancet*, in which the woman was at one time totally blind, and after partial apparent convalescence died in the third or fourth month of a second pregnancy. He says, "this is evidently a case of albuminuria intensified by each pregnancy and showing in a very marked manner the influence which pregnancy exerts over the progress of the disease." Herter² reports a case of albuminuric retinitis in a woman in the eighth month of pregnancy, in which detachment of the retina occurred with accompanying blindness in both eyes.

At a meeting of the Buffalo Medical Association held May 6, 1883, Dr. Cronyn reported a case of a woman who had impaired vision in one pregnancy, but recovered. In a second it appeared earlier and amounted to absolute blindness. He produced artificial labor in the eighth month, but she remained blind and died three months later.

It is certainly no uncommon thing to have a woman date the loss of vision from about the time of a confinement. For awhile I was very skeptical as to there being any connection between the two events, appreciating how naturally an imaginative person might misjudge a simple coincidence, but I am satisfied that in many instances the blindness was due to the pregnant condition. A formidable objection to such a conclusion was that only one eye remained blind, whereas albuminuric retinitis affects both, but a close examination of the optic nerve and retina in these afflicted eyes often shows that the atrophic condition there presented is just such as follows neuro-retinitis. The simple fact was, that in one eye the effusion absorbed and vision improved, and for some unknown reason the process advanced to atrophy of the nerve and blindness resulted. Any oculist can probably turn to several such examples by consulting his record of cases. I select a few.

April 16, 1880, I was consulted by J. C. E., an intelligent woman of 44, who stated that at the time of a confinement twenty-four years ago she was severely ill and the vision in

1 1880: Vol. I., p. 758.

2 Herter, *Annales de la Charité*, 1877, p. 519.

both eyes was much impaired, but afterwards the right improved while the left gradually grew worse. An examination of the interior shows that the right eye is quite normal, but in the left there is a partly atrophic condition of the disc and other changes such as accompany neuritis with neuro-retinitis of this kind. Examination presented a condition similar to that described.

Unfortunately there is sometimes no question as to the cause of the impaired vision, and this persists in both eyes for a very long time, or even permanently, to a degree which amounts practically to blindness. For example, on the 30th of July, 1883, I was consulted by a lady in regard to albuminuric retinitis. Six months previously, when about three months pregnant, she noticed a failure of vision; by the early part of January she could not see to read, and before April she was totally blind. Premature delivery was urged on account of the albuminuria and other symptoms, but as a prominent physician in the neighborhood objected on legal grounds, the operation was postponed. Fortunately nature came to her relief, and the lady aborted in the eighth month, the labor being attended with convulsions. A final example will suffice, and this is unfortunately a most typical one. On the 4th of April, 1883, I was consulted by a patient in regard to a loss of vision of this kind two years previously, when in the seventh month of pregnancy the vision began to be impaired. This grew worse until she was almost blind. At that time, May 24, 1883, she had a miscarriage, and soon after the vision began to improve. The changes for the better were slow, but ultimately she could read large print, about Jaeger test type No. 10. Unfortunately she became pregnant again, and again the vision grew worse, but this time at an earlier period and more completely than before. By the sixth month she was virtually blind. A miscarriage occurred in the eighth month, but only slight improvement of vision followed. Various methods of treatment were tried with little, if any, success. At best she could count fingers with the right eye at six feet and with left at fifteen inches. She died from the effects of the albuminuria in the last of May, 1884.

Enough has been said, I think, to show the importance of the subject, and the fact that life is often endangered when the

vision is. This naturally brings us to the second point, namely, that on account of this double danger, the production of abortion is occasionally advisable. From purely an ophthalmic point this proposition requires no discussion. Let us only see what is the opinion of obstetricians. Among the strong advocates for the induction of labor in cases of albuminuria I should mention first of all the late Professor Elliot of Belleville College. The opening chapter of his obstetric clinics treats of the relations of albuminuria to pregnancy, and this he begins by citing the case of a woman who, together with other symptoms of that complication, suffered from disturbance of the eyesight; the usual treatment for such cases was carefully followed out, but she was allowed to go to full term and then died soon after confinement.

Professor Elliot gives a number of cases which are of interest in connection with our study.

No. 7 is that of a young woman with albuminuria. In the third month a miscarriage occurred, but the patient sank and ultimately died.

No. 8 is that of a woman of 36, in the ninth month. She had albuminuric eclampsia and complained of a "blur over the eyes." The cervix was dilated with the fingers, and with the douche labor was brought on, but she died the next day.

He says,¹ "unless the decision to be arrived on account of existing eclampsia or other serious contingency, if the result be not satisfactory hostile criticism will not be withheld; and if it be satisfactory and both lives be saved, it may be suggested that the operation was unnecessary, meddlesome and hazardous."

Playfair says,² "I believe that, having in view the undoubted risks which attend this complication, the operation is unquestionably indicated and is perfectly justifiable in all cases attended with symptoms of serious gravity. It is not easy to lay down any definite rule to guide our decision, but I should not hesitate to adopt this resource in all cases in which the quantity of albumen is considerably and progressively increasing, and in which treatment has lessened the amount, and above all in every case

1 Same, p. 39.

2 System of Midwifery, p. 201.

attended with threatening symptoms such as headache, dizziness or loss of sight.

The risks of the operation are infinitesimal compared with those which the patient would run in the event of puerperal convulsions supervening or chronic Bright's disease becoming established. As the operation is seldom likely to be indicated until the child has reached a viable age, and as the albuminuria places the child's life in danger, we are quite justified in considering the mother's safety alone in determining on its performance. Fordyce Barker¹ says: "I have no hesitation when the symptoms of albuminuria are of so grave a character that there is every probability that their continuance will result in the death of the mother, in advising and urging that labor should be brought on. I have never regretted giving this advice. The only regret that I have ever had on this subject has arisen when such action has been too long postponed by baseless hopes on the part of those with whom I have been associated. The success or non-success of the measure has nothing to do with the moral question.

Prof. Lusk² gives due weight to the opinions of others in favor of procrastination by saying "My own convictions are clear, that so soon as grave cerebral symptoms develop, the period of folded hands has passed." Moreover it is necessary to take cognizance of the well being of the foetus which is threatened by the continued circulation of urea in the natural blood.

Bedford³ is about the only writer who hesitates in making the operation at once, and consents to wait till nature initiates the process. Prof. Carl Braun⁴, of Vienna, states that in puerperal convulsions the fatality to the mother will average thirty per cent. It is more fatal to the foetus than to the mother when it comes on before delivery. Kelian up to 1883 had gathered from various sources 161 operations, and of these it appears that considerable more than one-half of the children are rescued with the insignificant mortality of one in fifty mothers. Many other au-

1 The Puerperal Disease, p. 82.

2 The Science and Art of Midwifery, p. 536.

3 The Principles and Practice of Obstetrics, by S. G. Bedford, p. 674.

4 Theory and Practice of Obstetrics, p. 454, 1 d., p. 447.

thorities might be cited and similar observations referred to, but in view of these statements there can be no doubt as to the weight of authority concerning the general question of the abortion. It remains only to determine, if possible, some of the factors which indicate the time for interference.

In order to draw a conclusion with some degree of accuracy concerning this important point, I have analyzed all the cases which I could find published as far back as 1870. These tend to show that when the vision begins to be impaired only in the last two weeks of pregnancy, recovery follows almost invariably. Of those described as being in the eighth month or thereabouts when the retinitis commences, not one half recovered and several did not materially improve. Finally, when this began earlier than what was estimated, as the middle of the seventh month, when nature did not interfere by bringing on a miscarriage, and when the patient escaped with her life, it was only to remain blind forever afterwards.

But it may be asked, is premature delivery warrantable in every case where albuminuric retinitis appear as early as eight or surely in the seventh month. Such a rule would be not only dangerous to the woman, but liable to criminal abuse. Evidently the circumstances will modify the course to be pursued. The time at which the retinitis appears and its degree is perhaps the most important factor in the problem to be decided, but next to this the quantity of albumen and the relative time of its appearance gives an indication as to the probable result.

Inasmuch as this is the cause of the dreaded symptoms, we naturally would expect the degree of danger to increase with the amount of albumen found. This is a convenient rule and in general a reliable one. As small as a tenth of one per cent. is sufficient to attract attention. The presence of one per cent should excite apprehensions, and so great a quantity as two or surely three per cent, is usually an indication of great danger; still we must be on our guard against sources of error; for example, I know of a case in which the urine of a patient had inadvertently been allowed to stand so long that considerable evaporation took place, and the amount of albumen shown in the analysis was really greater than that existing. On the other hand,

if diuretics are administered for the disease, and the quantity of water excreted is thereby increased, the proportion of albumen might appear relatively to diminish, although in reality it remained the same. Taking these sources of error and frequent variation into account, I can not think, therefore, that the amount of albumen is of as much importance as the time in the pregnancy at which it first appears. In the last month or six weeks it is said by obstetric writers to be no very infrequent occurrence, and not to be then of great significance. This is certainly substantiated by the experience of the oculist, but when it appears in the seventh month, in the sixth or surely earlier, and when it persists in spite of variations, it is certainly of grave importance. The vitiated blood then exerts its poisonous effects upon the retina and upon the vital organs of the mother or child for a long time, and no one can say how soon or in what way these effects may be shown, whether by sudden blindness, by a convulsion, or by the expulsion of a dead child. As we may give small doses of some medicine for a long time without apparent effect, and then there follows an explosion of violent symptoms, so does the history of these cases show that the prolonged existence of even a small amount of albumen may lead us to expect serious symptoms which may appear quite suddenly.

I think a sufficient amount of evidence has been adduced to establish the three points referred to, and in conclusion, it seems fair to infer that, the induction of labor is warrantable when the retinitis appears in a comparatively early stage of pregnancy and persists in spite of proper treatment, but is not warrantable in the last few weeks, in spite of the greater ease with which it is accomplished, unless the inflammation is usually severe.

MELANOTIC FIBRO-SARCOMA OF ORBIT REMOVED
TEN YEARS AFTER ENUCLEATION OF THE
EYE-BALL CONTAINING A PIGMENTED
GROWTH.

BY F. BULLER, M. D.,

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On May 27 of the current year Mrs. K., aged 48, came to me for advice on account of a painful affection of the right orbit, which for a number of years had been causing her a great deal of discomfort and annoyance. The history of the case as given in a communication from her medical attendant is as follows:

"About the year 1863 or 1864 Mrs. K. accidentally noticed she was minus the sight of the right eye. The pupil was dilated but did not present the appearance seen in fungus haematodes or encephaloid of the eye. At this time the optic nerve must have been affected. On ophthalmoscopic examination I discovered no disease of notice.

About the year 1865 she suffered from severe pain in the region of this eyeball which would shoot and extend from the occiput of the same side to the eye or from the eye to the occiput. About the year 1868 she suffered from an exceedingly severe attack of inflammation of the optic nervous apparatus eyeball and eyelids, and there were recurring attacks of inflammatory and neuralgic conditions of the lids, eye, etc., till about the year 1872 or 1873, when the other eye began to be affected as I thought through sympathy. This sympathetic affection continued with remissions and exacerbations until it was evident the left eye too would be wholly destroyed. I therefore advised the removal of the right eye which during all this time was giving her a great deal of pain. She finally consented to the operation which was done by the late Dr. Robertson, of Albany, in 1874.

On cutting into the eyeball after its removal the vitreous humor was quite dense, not like cartilage and not solid, it was

dark; if I rightly remember it was black and contained several spiculæ of bone, some of which were sharp pointed. I preserved for a long time one of these bones which was one-fourth of an inch or more in length, and this reminds me that for a year or two she had complained of a prickling sensation in the eyeball caused no doubt by these sharp points. She made a good recovery from the operation and the sympathetic trouble in the other eye subsided.

After two or three years the same pains and recurring inflammatory affections of the tissues of the lids and orbit reappeared and have persisted more or less ever since. Three or four years ago the orbit began to fill up. Two years ago next autumn it was about filled; she then had an exceedingly severe time with pain and inflammation of the surrounding tissues in close proximity to the orbit. The swelling in the orbit burst and then subsided very much but in a few months began to increase again."

The remainder of the communication, dealing with the family history of the patient contains nothing of importance. In some points the patient's own statements differ materially from those of her physician. She stated that about a year after the loss of vision was first noticed the eye swelled up and burst and then shrank; for some time afterwards she wore an artificial eye, but had to abandon its use owing to the discomfort it caused; that pain in the orbit and head returned within a year after the removal of the diseased eye, and were usually most troublesome during the early part of the night, though sometimes she could hardly get any sleep all night long on that account. After suffering for some hours sudden relief would occur with a copious flow of tears from the conjunctival sac; that the inflammatory swelling which occurred two years ago subsided without any discharge other than a watery fluid.

In the absence of a minute examination of the diseased eyeball after its removal the nature of the case cannot of course be positively ascertained though there is strong reason to believe the eyeball was filled with a pigmented sarcomatous growth at the time of its removal ten years ago.

The left eye is entirely normal and shows no trace of sympa-

thetic trouble. Mrs. K. does not appear to have suffered in her general health and presents no sign of functional or organic disorder other than that within the orbit. The eyelids on the affected side are slightly swollen and darker than on the other side; and there is some lachrymation from the empty conjunctival sac, but the conjunctiva is perfectly healthy. *Only in the centre of the sac there is a small area of a darker color than elsewhere, transversed by a few dark tortuous veins.* Here too the conjunctiva rests upon a firm mass which is not subject to even a trace of muscular movement.

The orbit is in fact two-thirds filled by a firm somewhat nodular mass, not adherent to its walls at the periphery but not movable to any extent.

Pressure on this mass from below upwards causes pain but not from above downwards. There is nowhere the least suspicion of fluctuation. Without forming a positive opinion as to the nature of the growth though the dark patch over its central portion was strongly suggestive of its pigmented character, I advised its removal with a view to remove the almost constant pain caused apparently by its presence. To this the patient readily consented. The tumor was removed June 3. In order to have plenty of room I divided the outer canthus, then dissected back the healthy conjunctiva; with curved scissors and the fingers I removed an isolated ovoid mass of a dark color enclosed in a delicate capsule and having a somewhat lobulated surface; this mass two and a half cm. in length, two cm. wide and one cm. in thickness, and quite firm in texture. After its removal the apex of the orbit was found to be occupied by a considerable quantity of softer material which was cleared out with the curved scissors as completely as possible and when the moderate bleeding had ceased chloride of zinc paste was applied to the deep portion of the orbit in the usual way. The patient made a satisfactory recovery and returned home at the end of a week. As yet there is no return of the growth though it is of course too soon to expect any such result, but she remains free from pain and in so far success has been achieved by the operation.

The ovoid mass first removed showed on section a mottled appearance being divided into lobules of a dark color and irregular

as to size and shape, by broad bands of pale fibrous tissue. The central portion of the lobule was made up almost entirely of cellular elements, but even here in these sections logwood staining brought out a delicate linear meshwork of white fibrous tissue so arranged as to give the appearance of their being placed in rows in its long meshes.

In parts the cells were nearly all crowded with granules of a golden brown or black pigment, which for the most part was uniformly distributed in the cell plasma. Very few have more than one nucleus, which was always remarkably distinct. In certain localities pigmented and non-pigmented cells were present, in about equal proportion, and in others none were pigmented.

Throughout the growth the prevailing character of the cells was spindle-shaped with long processes, or oat-shaped, though round cells were not wanting in any of the cellular parts, and in places were in excess of the others. Multipolar cells were extremely rare, though not entirely wanting.

As a general thing the non-pigmented cells were smaller than the pigmented. The others were precisely similar in character and arrangement.

The pale portion of the tumor consisted almost exclusively of white fibrous tissue; the same is true of its capsular envelope; yellow elastic fibres were also present in the peripheral parts of the fibrous intersection of the growth. The growth was by no means a very vascular one, though traversed by a network of delicate capillaries. The larger blood-vessels were characterized by their very thick walls and relatively narrow limits, a circumstance which may in some measure seem to account for the slow development of the tumor. Extravasated blood corpuscles were present in small areas, here and there, and in some places, extra cellular deposits of granular pigment, probably of haemorrhagic origin. The softer, posterior, deepseated portion of the mass in the orbit was of a dull, red color, very friable and almost pulpy in consistence.

Portions of this treated in the same manner as the preceding were seen to consist almost entirely of small round cells, interspersed with numerous extravasations of blood. In some places

blood corpuscles and tumor cells were found mingled in almost equal proportion. The cells contained very large nuclei. Possibly many of them were free nuclei, at least they had that appearance. In a few places, similar small round cells were charged with brown pigment granules, but as this always occurred at or in the vicinity of blood extravasation, and in association with considerable quantities of free pigment, there is some doubt as to origin in the cells containing it. Certainly neither the quantity nor the distribution of this pigment would warrant our calling this portion of the growth melanotic.

The stroma consisted of a finely granular, slightly fibrillated material. Blood-vessels, as such, were not discoverable, but in certain small areas there existed an arrangement of embryonic looking tissue which probably belonged to the vascular system. Here and there were channels of various widths enclosing quantities of blood corpuscles, but without definite walls, unless the gradual transition of round to elongated tumor cells, with their long axis parallel to the channel, could be considered as constituting the vessel wall.

It appears from the foregoing that we had to deal with a mixed growth, the first encapsuled portion being distinctly fibrous in character, and perhaps best designated as a melanotic fibro-sarcoma, whilst the softer, deep-seated growth was evidently a round-celled sarcoma.

In both we are confronted with a wide deviation from the wellknown propensities of these growths.

Assuming, as I think we may, that the primary lesion was a pigmented choroidal sarcoma, the date of its recurrence in the orbit after removal of the eye may fairly be placed at the period when the persistent orbital and neuralgic pains returned, that is within a year or two after the eye was removed, inasmuch as the patient was entirely free from pain for a year or two after the first operation, but since they returned has never enjoyed more than a few days relief at a time.

So long as the growth had not extended beyond the limits of the encapsuled portion its presence would certainly not have been revealed to the patient, or to an unskilled observer, since it had not attained a sufficiently large size to encroach visibly upon

the surrounding parts and alter their appearance; and in view of its fibrous character it may very well have been growing slowly for years. The tendency to slow or comparatively slow growth in the more fibrous melanotic tumors is, I believe, generally admitted, but I have not been able to find any case on record *that so strongly emphasizes the principle or law as this one does.*

Then again, the round-celled, deep-seated growth can hardly have originated later than four years ago, when the orbit was found to have become nearly filled up. The sudden enlargement and inflammatory attack of two years ago may have been due to a haemorrhage into its substance, and the obvious tendency to extravasate discovered by the microscope renders this assumption highly probable; nevertheless the inflammatory attack might reasonably have been expected to excite or increase the tendency to rapid growth which round-celled sarcomata are well known to possess; this, however, clearly did not occur, and in spite of the apparently favorable conditions for rapid development, the case preserved its original torpid character to the end, and it is to be hoped the anticipated recurrence will follow in the same line.

I have been unable to arrive at any satisfactory explanation of the pains becoming here so conspicuous a symptom throughout the past ten years, for however easily we may understand the pains which existed for years before enucleation of the diseased eye, there was certainly nothing in the nature, size or position of the orbital recurrence; that should have rendered it the source of great or persistent pain, but the freedom from pain since its removal indicates the one as the cause of the other.

TRANSLATION.

In an article on experimental researches concerning the tuberculosis of the cornea in the *Archives d'Ophtalmologie* Panas and Vassaux give the following very interesting experiences:

* * * The course of this malady is divided into a certain number of periods. Indeed, between the inoculation and first appearance of the lesions a certain period elapses, during which the cornea retains its normal appearance. This is the period of incubation.

The tubercle once formed develops and becomes enlarged. This is the second period, or the period of evolution, which stops at the moment when the epithelium, which covers the tubercle, is shed. Then begins the period of ulceration.

It is an important fact that this tubercle having arrived at the height of evolution is reproduced by surrounding itself with young colonies which do not hesitate to unite with the primary source, to ulcerate and to assist in enlarging the loss of substance. This second period of evolution, therefore, may be divided into the period of evolution proper and into the period of dissemination.

The tubercular products having arrived at the heights of evolution, begin to disintegrate, and are eliminated at the same time as are the tissues in which they have been developed, leaving a loss of substance of variable size and extent. This is the third or period of ulceration.

Under the influence of the nutritive material, furnished by the vessels of the pannus, the ulcer is cleansed; the virulent ulcer is changed into a simple one and heals and cicatrices. Therefore we must admit a fourth period—that of reparation. Finally, according to the extent and depth of the ulcer, healing takes place with more or less loss of substance. According to our observations one cannot assign an exact limit to anyone of these periods.

The period of incubation has varied from eight to ten days.

The ulceration has shown itself from the eighth to the twenty-second day and reparation has followed from the twelfth to the forty-fourth day after the first appearance of a tubercle. Indeed, one can understand that the duration of the periods of evolution, ulceration and reparation will be subordinate to the virulence and to the number of successive generations of tubercles.

The progress of the disease, furthermore, is not always the same; the ulceration can assume a serpiginous or phagedenic character, and destroy nearly the whole of the cornea and even perforate it. This has been the case with our fourth rabbit.

In certain cases the process may be an exceptionally benign one. Ulceration then does not take place at all, as was the case with our seventh rabbit. Healing follows without loss of substance only a slight dimness in the cornea remaining. That in these cases the result of the inoculation was not a negative one was proven by the fact that small disseminated tubercular nodules were formed, as in other cases.

The animals remained under observation during a period of from two to eight months. During all this time the rabbits were not kept in the most desirable hygienic surroundings (insufficient aeration, excessive heat, close confinement) and did not die; and at their autopsy, no generalization of the tubercles in the viscera was found. Two of them presented some disseminated tubercles at the base of the lungs. This, however, is not rare, as it is a well known fact that similar tubercular lesions often exist in rabbits in the best of hygienic conditions.

During the course of these experiments only a single animal perished. At the autopsy of this one a general fibrino-purulent inflammation of the pleura, lungs, pericardium and peritoneum was found. (This was due to an error. Dr. Taiamon, who was making some researches in regard to infectious pneumonia had inoculated this animal for his purposes.) In no part of the rest of the body tubercles were found; moreover, one inoculation with these fibrino-purulent products produced panophthalmitis in both eyes of another rabbit, of such rapid a course as to necessitate the sacrifice of the animal

on the fourth day after the inoculation. At the autopsy purulent panophthalmitis and purulent peritonitis with adhesions were found. No tubercles.

The eyes of all these animal were subjected to a histological examination.

This paper, however, deals only with two stages; the one in which the tubercle is in full activity, the other in which the tubercle is on the way of reparation or completely cicatrized. The other stages will be the object of a later analysis. Our chief aim being to study the clinical march of the disease.

In one of these rabbits killed on the sixtieth day after the inoculation, we saw the mode of development and growth.

We were surprised in examining the microscopic sections, to find nearly a complete absence of giant cells as we habitually see them in man. According to our observations the tubercular nodule makes its appearance through the newly formed capillaries; the corneal corpuscles, dividing and subdividing, gradually arrange themselves around the vessels; at the same time their cellular body becomes more brittle and appears like elements undergoing amyloid degeneration. Very soon numerous leucocytes infiltrate this mass of epitheloid cells.

At a more advanced stage the lumen of the vessel is obstructed by a fine granular mass, in the center of which some leucocytes can be distinguished; the endothelial cells of the wall of the capillary disappear; the surrounding epitheloid cells become more and more granular and adjoining them a layer of round cells is found which absorbs carmine energetically.

Later, the lumen of the vessels has disappeared completely and is replaced by a fine granular or some fibrillar mass filled with very fine angular corpuscles having a great affinity for carmine; the surrounding epitheloid cells become indistinct and only the most peripheral layer of round cells remains unaffected.

Although the giant cells are wanting, the bacillus of Koch is constantly found and the more numerous the farther the disease has progressed. All this goes to prove that we have to deal with true tubercles.

The examination of tubercles beginning to cicatrize and at the stage of complete healing reveals results not less interesting.

In the second rabbit on whom we have with preference studied the course of disease, we have seen complete healing to take place, leaving only a whitish and somewhat prominent spot on the cornea.

The entire cornea and even the nodule are again covered by normal epithelium. At the latter place the epithelial elements are interspersed with leucocytes.

The nodule is composed of an agglomeration of round cells, pressing each other, and which invade the corneal tissue proper and the interlamellar spaces. No elements undergoing granular fatty degeneration, nothing recalling the structure of a tubercle, moreover, no bacillus could be found. We can therefore say that we are dealing with a remnant of inflammatory elements about to disappear. From this nodule these same round elements could be followed up sufficiently far, in the interlamellar spaces, but they were found in the most superficial layers of the cornea only and here and there some capillaries gorged with yellowish or brownish granules, composed of haematoidine. The rest of the membrane, Descemet's membrane with its epithelium, the iris and ciliary body were sound.

In the seventh rabbit the lesion healed completely with a cup-shaped loss of substance; the epithelium of the cornea covers the entire concavity of this loss of substance and even presents at this place a thickness nearly double that of the normal layer of epithelial cells; there are also some round cells in the interlamellar spaces; no bacilli. Descemet's membrane and other portions of the eye are normal.

In the third rabbit the cornea was destroyed to a very considerable extent in consequence of the ulcerative process, and in more than two-thirds of its thickness; so that at this place the membrane was only represented by the thin layer of Descemet's membrane, protected by a layer of cicatricial tissue substituting the corneal tissue. All this immense loss of substance was covered again by an anterior and posterior epithelium. No alterations of the deep membrane; no bacilli.

Thus we see that the beginning of this experimental tuberculosis is characterized by the appearance of a milky spot in the tissue of the cornea, accompanied or preceded by scleral injection.

This spot turns rapidly into an abscess and the abscess may have two destinies:

It may be absorbed; healing then follows without any damage to the cornea.

Or, what happens more frequently, it ulcerates and heals with more or less loss of substance, leaving as a trace of its existence, a nebula, macula or leucoma.

The lesions, whatever may be their extent, remain localized exclusively in the cornea. They are propagated to other portions of the eye only under one condition; that is, if there is a perforation of the membrane and the tubercular virus penetrates into the anterior chamber.

The conditions are then as if the iris had been directly inoculated, and it is well known with what rapidity these tubercular lesions are propagated in the uveal tract and other portions of the eye. The third rabbit is an example of this; we have said previously that, at the time of inoculation, in consequence of a rapid movement of the animal, the lance had penetrated into the anterior chamber.

Starting from the idea that suppurative lesions of the cornea, which until recently were thought to be lymphatic or strumous, might well be something else; for instance tubercular, we have made use of the first opportunity which was offered to us, that of an individual presenting an abscess of the deep layers of the cornea, resembling in a great measure, what we had seen experimentally in the rabbit. A small flap containing the abscess was taken from the cornea, then incised and placed immediately into the anterior chamber of a rabbit. The result, although negative, merits to be reported here to make our investigations complete. On the May 15, 1884, a man, aged 54 years of age, of scrofulous habit, anaemic, having had swollen glands in his youth, presented himself at the ophthalmic clinic of the Hotel-Dieu.

There was a small irregular, yellowish deeply situated spot in the left cornea presenting the aspect of the tubercles which we had produced experimentally. Pericorneal injection was somewhat intense, some vessels even advanced into the corneal substance. By means of a Graefe knife this small caseous ab-

scess was detached together with some layers of the cornea and introduced immediately into the anterior chamber of a rabbit. No inflammatory reaction appeared and some days afterwards this fragment had become attached to the iris. Nothing special was produced in the anterior chamber, nor on the iris, and four months later a broad iridectomy including the corneal graft was made.

By the histological examination a complete attachment of the fragment to the iris is verified. In this fragment are found the characteristic structure of the cornea and Bowman's layer with some migrating cells here and there. Every trace of the abscess had disappeared.

Conclusions.—The result of these researches prove, without doubt, that tuberculosis of the cornea, spontaneous as well as experimental, is identical with certain forms of keratitis which are actually strumous or at least taken for such.

As has been done in general surgery it is necessary in the present stage of science to revise this part of the pathology of the cornea and to see if not some abscesses and ulcers of the cornea, of strumous origin, are in reality manifestations of a localized tuberculisalation of this membrane.

To decide this question, the argument taken from the non-generalization of the tubercle in the other portions of the eye and in the rest of the organism, will be no longer of value. We have proven in fact, that the inoculation of the tubercle in the cornea may heal, as it does in other tuberculosis, (testicle, articulations, bone, connective tissue and even in the lungs.)

The only thing to do in doubtful cases is to look for the bacillus of Koch, in the pus of corneal abscesses; or what would be still better, to inoculate a sound animal with this product known to be tubercular. (The inoculation is best made in the anterior chamber or in a serous cavity). Taking it for granted that a local tuberculosis can heal, and as we are until now ignorant of cases of the generalisation of such tuberculosis, we have at present no right to propose partial abscision, much less the total removal of the diseased organ to prevent the generalisation of the disease.

Finally, it is a curious fact that even the inoculation with

tubercular material in the interior of the eye of the rabbit only exceptionally gives rise to a general tuberculosis. This fact is totally in opposition to the doctrine which prevails to-day, and according to which we advise the enucleation of the eyeball as soon as the existence of tubercles in the eye is recognized, in order to prevent thus the generalization of the malady in the rest of the organism.

In an excellent paper on the zonule of Zinn, in *Graefe's Archiv f. Ophthalmologie*, Dr. Wilhelm Czermak arrives at the following conclusions:

2. The zonule of Zinn is not a membranous structure, but a very complicated system of fibres. The space which is traversed by these fibres is a part of the posterior chamber and is filled with aqueous humor. The so-called *canalis Petitii* does not exist.

2. The origin of the fibres of the zonule of Zinn lies in the limina vitrea of the pars ciliaris retinae; not a single fibre takes its origin from the vitreous body. The lamina vitrea does not pass over into the limitans interna retinae, but into the limiting layer of the vitreous body.

3. There are found a number of endothelial and a great many migratory cells, which with their protoplasmatic offsets cling to the fibres of the zonule of Zinn.

4. The fact, named sub. No. 2, explains the way in which Aeby's and all other macroscopical specimens were obtained and why the lamina vitrea of the pars ciliaris retinae, when torn off, was taken to be actually the zonule of Zinn.

The following are some of the conclusions arrived at by Th. Treitel in a paper on hemeralopia and the examination of the light-sense, published in the *Archiv f. Ophthalmologie*:

1. Hemeralopia is not caused by a defect of the light-sense, but by a defect of adaptation. The adaptation has become

slower in those cases of hemeralopia which can be healed, while in imperfectly curable or totally incurable ones this faculty is partially or altogether lost. In consequence of the abnormal adaptation of hemeralopics their senses for space, color and light are reduced in reduced light.

2. The fact, that patients suffering from idiopathic hemeralopia as a rule can see perfectly well in daylight leads to the conclusion that the pathological changes, which produce hemeralopia, do not lie within the nervous part of the visual apparatus; we must arrive at the same conclusion by the fact that we never observe hemeralopia in cases of disease of the conducting nerve-apparatus, and but very seldom in diseases of the retina.

3. It is probable that the pathological process causing hemeralopia lies in the pigment epithelium which secretes the retinal purple. Yet, there may be lack of pigment without hemeralopia as well as normal pigmentation of the epithelium combined with hemeralopia, since the secretory activity of the epithelium is not dependent on the pigment.

4. Since we call the faculty of an eye of differentiating between varying degrees of light the light-sense, we will only be able to detect anomalies of the light-sense by finding out the smallest difference in light, which can be perceived by the examined eye.

5. The (apparent) defects in light-sense, color-sense and space-sense caused by hemeralopia cannot be compared with the (real) defects in function caused by affections of the nervous visual apparatus.

6. To detect the real anomalies of the light-sense, color-sense and space-sense of hemeralopic amblyopics is only possible by strong light, those of amblyopics without hemeralopia may be detected by reduced light. * * *

CORRESPONDENCE.

Dr. A. Alt:

DEAR DOCTOR.—On page 76 of the last issue of your journal you gave a synopsis of my paper read before the recent meeting of the American Medical Association. The subject of the paper was "The Relation of Errors of Refraction to Headache." This not being stated in your report makes it look as though my remarks belonged to Dr. Murrell's paper. I shall be pleased if you have this corrected.

Sincerely yours,

JOHN F. FULTON.

Adolf Alt, M. D.:

DEAR DOCTOR.—Please make the following corrections in my article in the "American Journal of Ophthalmology," No. 3 and 4, page 87, ninth line from the bottom, for abrasion read abscision, and on page 88, fourth line from the bottom, the same correction, and on the same page the ninth line from the top, for affected read effected, also same page, first line change 1866-7 to 1876-7.

Very Respectfully,

H. CULBERTSON, M. D.